

CLAIMS

What is claimed and desired to be secured by Letters Patent is as follows:

1. A system for controlling the braking system of a towed vehicle being towed by a towing vehicle, the system comprising:
 - (a) a towing vehicle subsystem for a towing vehicle, including:
 - (1) a towing vehicle control mechanism including a monitoring mechanism with a display device having a brakes-on indicator,
 - (2) a towing vehicle receiver mechanism that includes first circuitry connected in communication with the towing vehicle control mechanism wherein the towing vehicle receiver mechanism is structured and configured to operatively and wirelessly receive modulated digital signals;
 - (b) a towed vehicle subsystem for a towed vehicle, including:
 - (1) a towed vehicle control mechanism,
 - (2) communication means connecting the towed vehicle subsystem in communication with the towing vehicle subsystem,
 - (3) a linkage mechanism connecting the towed vehicle control mechanism to the braking system of the towed vehicle,
 - (4) a sensing mechanism connected in communication with the towed vehicle control mechanism wherein the sensing mechanism includes a braking sensor structured and configured to operatively

sense activation of the braking system of the towed vehicle, and
(5) a towed vehicle transmitter mechanism connected to the towed vehicle control mechanism that includes second circuitry structured and configured to operatively and wirelessly transmit modulated digital signals to the towing vehicle transmitter mechanism; and

- (c) at least one power source providing electrical power to the towing vehicle subsystem and the towed vehicle subsystem; and
- (d) wherein actuation of the towing vehicle control mechanism by an operator of the towing vehicle actuates the towed vehicle control mechanism causing the linkage mechanism to actuate the braking system of the towed vehicle and wherein the sensing mechanism, upon sensing actuation of the braking system of the towed vehicle, causes the towed vehicle transmitter mechanism to wirelessly transmit modulated digital signals to the towing vehicle receiver mechanism which, in conjunction with the towing vehicle control mechanism, causes the display device to indicate that the braking system of the towed vehicle has been actuated.

2. The towed vehicle braking control system as described in claim 1, further including:

- (a) the sensing mechanism having an accelerometer that provides deceleration signals to the towed vehicle control mechanism, wherein the deceleration signals reflect the magnitude of deceleration being experienced by the

towed vehicle; and

- (b) the towed vehicle control mechanism is structured and configured to compare the magnitude of the deceleration signals provided by the accelerometer with the magnitude of a selected one of a plurality of magnitudes of deceleration; and
- (c) wherein the towed vehicle control mechanism actuates the linkage mechanism if the magnitude of the deceleration signals provided by the accelerometer exceeds the magnitude of the selected one of a plurality of magnitudes of deceleration.

- 3. The towed vehicle braking control system as described in claim 2, wherein the plurality of magnitudes of deceleration includes at least eight different magnitudes of deceleration.
- 4. The towed vehicle braking control system as described in claim 3, wherein the linkage mechanism includes two electronically actuated pneumatic valves, that are actuatable by the towed vehicle control mechanism in response to deceleration signals provided by the accelerometer that exceed the magnitude of the selected one of the plurality of magnitudes of deceleration, and the two electronically actuated pneumatic valves are automatically deactuated as the magnitude of deceleration as reflected by the deceleration signals provided by the accelerometer operatively falls below the magnitude of the selected one of the plurality of

magnitudes of deceleration.

5. The towed vehicle braking control system as described in claim 2, wherein the linkage mechanism includes two electronically actuated pneumatic valves that are actuated by the towed vehicle control mechanism when the magnitude of deceleration as provided by the accelerometer exceeds the selected level of magnitude of deceleration.
6. The towed vehicle braking control system as described in claim 1, wherein
 - (a) the towed vehicle subsystem includes a towed vehicle multi-position DIP switch, wherein the towed vehicle DIP switch is structured and configured to provide encoding to the modulated digital signals transmitted by the towed vehicle transmitter mechanism; and
 - (b) the towing vehicle subsystem includes a towing vehicle multi-position DIP switch, wherein the towing vehicle DIP switch is structured and configured to decode the modulated digital signals received by the towing vehicle receiver mechanism from the towed vehicle transmitter mechanism.
7. The towed vehicle braking control system as described in claim 6, wherein the towing vehicle receiver mechanism demodulates the modulated digital signals received from the towed vehicle transmitter mechanism and produces an output

that is analyzed by a decoder portion thereof to determine whether the settings of the switches of the towed vehicle DIP switch, as encoded in the modulated digital signals wirelessly received by the towing vehicle receiver mechanism from the towed vehicle transmitter mechanism, match the settings of the switches of the towing vehicle DIP switch.

8. The towed vehicle braking control system as described in claim 7, wherein the towing vehicle control mechanism actuates the brakes-on indicator if the towing vehicle control system determines that the settings of the switches of the towed vehicle DIP switch match the settings of the switches of the towing vehicle DIP switch.
9. The towed vehicle braking control system as described in claim 1, wherein the braking sensor cooperatively includes the brake signal light conductor of the towed vehicle.
10. The towed vehicle braking control system as described in claim 1, wherein the towed vehicle transmitter mechanism has a transmit mode and a standby mode.
11. The towed vehicle braking control system as described in claim 1, wherein the digital signals are frequency modulated by the towed vehicle transmitter mechanism.

12. The towed vehicle braking control system as described in claim 1, wherein the digital signals are frequency modulated with a carrier signal having a frequency of 916 MHz.
13. The towed vehicle braking control system as described in claim 1, wherein the power source includes a connector for connecting the towed vehicle subsystem and/or the towing vehicle subsystem to a cigarette lighter socket of the respective towed or towing vehicle.
14. The towed vehicle braking control system as described in claim 1, wherein the communication means includes:
 - (a) a towing vehicle transmitter mechanism having third circuitry connected in communication with the towing vehicle control mechanism, wherein the towing vehicle transmitter mechanism is structured and configured to operatively and wirelessly transmit second modulated digital signals; and
 - (b) a towed vehicle receiver mechanism having fourth circuitry connected in communication with the towed vehicle control mechanism, wherein the towed vehicle receiver mechanism is structured and configured to operatively and wirelessly receive the second modulated digital signals transmitted by the towing vehicle transmitter mechanism.
15. An interactive system for remotely controlling the braking system of a towed

vehicle, comprising:

- (a) a towing vehicle subsystem positioned in a towing vehicle and including:
 - (1) a towing vehicle control mechanism including a monitoring mechanism with a display device,
 - (2) a towing vehicle transmitter mechanism having first circuitry connected in communication with the towing vehicle transmitter mechanism that is structured and configured to operatively and wirelessly transmit towing vehicle encoded digital signals, and
 - (3) a towing vehicle receiver mechanism having second circuitry connected in communication with the towing vehicle control mechanism that is structured and configured to operatively and wirelessly receive and decode towed vehicle encoded digital signals;
- (b) a towed vehicle subsystem positioned in a towed vehicle and including:
 - (1) a towed vehicle control mechanism,
 - (2) a towed vehicle receiver mechanism having third circuitry connected in communication with the towed vehicle control mechanism that is structured and configured to operatively and wirelessly receive and decode the towing vehicle encoded digital signals,
 - (3) a linkage mechanism connecting the towed vehicle control mechanism to the braking system of the towed vehicle,
 - (4) sensing mechanism connected in communication with the towed

vehicle control mechanism, the sensing mechanism having sensors positioned to operatively sense activation of the braking system of the towed vehicle, and

(5) a towed vehicle transmitter mechanism including fourth circuitry and connected to the towed vehicle control mechanism that is structured and configured to operatively and wirelessly transmit towed vehicle encoded digital signals; and

- (c) at least one power source supplying electrical power to the towing vehicle subsystem and the towed vehicle subsystem; and
- (d) wherein activation of the towing vehicle control mechanism by an operator of the towing vehicle actuates the towed vehicle control mechanism by:
 - (1) causing the towing vehicle transmitter mechanism to transmit towing vehicle encoded wireless digital signals to the towed vehicle receiver mechanism,
 - (2) activating the towed vehicle control mechanism to cause:
 - (A) the linkage mechanism to actuate the braking system of the towed vehicle, and
 - (B) the sensing mechanism, upon sensing the activation of the braking system of the towed vehicle, to cause the towed vehicle transmitter mechanism to transmit second encoded wireless digital signals to the towing vehicle receiver mechanism which, in conjunction with the towing vehicle

control mechanism, causes the display device to indicate that the braking system of the towed vehicle has been actuated.